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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
GUTIERREZ, KEVIN C	

ART UNIT	PAPER NUMBER
2851	

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Please find below and/or attached an Office communication concerning this application or proceeding.

SF

Office Action Summary	Application No.	Applicant(s)	
	10/733,771	VAN BEEK ET AL.	
	Examiner	Art Unit	
	Kevin Gutierrez	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks, filed November 23, 2005, with respect to specification, drawings, and claims have been fully considered and are persuasive. The objection(s) of specification, drawings and claims has been withdrawn.

2. Applicant's arguments filed November 23, 2005 have been fully considered but they are not persuasive.

Regarding the independent claims, (page 9; top of the page, third and fifth paragraphs), the Applicant states "Somekh teaches to generate the oxidizer within the oxygen source, and not within a flow of gas from the source." The Examiner respectfully disagrees in which that the oxygen source **216** contains a flow of gas whether it is activated or not. Therefore, radicals are then generated in the flow of gas from the source when the oxidizer is activated. Furthermore, a control unit **219** controls the flow rate of the gas.

Regarding claim 7 (page 10, top of the page), the Applicant states "the combination of Horiike et al. and Somekh would merely provide Somekh with a cleaning chamber for the wafer." However, this limitation is not stated in the claims. Therefore, the combination of Horiike et al. and Somekh would teach a "structure comprising a device that moves a component containing said surface such that the beam of radicals is incident on said surface."

Regarding claims 18 and 19 (page 10, last two paragraphs), the Applicant states "Vane does not disclose or suggest that the plasma generates a localized beam of radicals and, hence, does not disclose or suggest and 'a radical source connected to a gas supply and configured to generate a localized beam of radicals.'" The limitations above are disclosed by Somekh (fig. 2A, where a radical source (**224**; nozzle) is connected by a gas supply (**216**; oxygen source) to generate a localized beam of radicals (col. 6, lines 55-57, where the flow rates of the radicals can be controlled).

However, Vane teaches the conductive screen **53** placed at the gas exit, which meets the limitation of claim 19 "wherein a Faraday grid is disposed at the orifice of the tube (col. 7, lines 62-63)." Furthermore, Vane teaches that the conductive screen **53** does not trap the charged species of the plasma in which the plasma is self-limited by the recombining with the ions and electrons available. Thereby, it meets the limitations of claim 18 "wherein a Faraday grid neutralizes the ionized particles."

Regarding claim 17 (Page 11), the Applicant states "the active species are generally supplied to the chamber **3** and are not formed into a localized beam." However, the limitation above is disclosed by Somekh as stated above regarding claims 18 an 19. The Applicant further states "Sakai et al. discloses that "other species, such as the electrons or the positive ions do not go into the second chamber **3** because these species are too short lived to be carried into the chamber **3**." However, this limitation is not set forth in the claims. Sakai et al. teaches gasses being dissociated in a quartz discharge tube **18** (col. 3, lines 49-51), which meets the limitations of claim 17 "wherein walls of the tube neutralize ionized particles."

The Examiner has addressed the Applicant's arguments and respectfully disagrees with regards to the claim rejections. Therefore, the rejection is maintained.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 8-16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Somekh (6,427,703).

Regarding claims 1 and 14, Somekh discloses

- "a support structure (220) constructed to support a patterning structure (208), said patterning structure adapted to pattern a beam of radiation (203) according to a desired pattern;
- a substrate holder (212) constructed to hold a substrate (214);
- a projection system (210) customized and arranged to project the patterned beam onto a target portion of the substrate (214);
- a downstream radical source, connected to a gas supply (216), configured to provide a beam of radicals directed onto a surface to be cleaned (col.7, lines 19-21).
- wherein the radicals are generated within a flow of gas (gas flows within the gas supply whether the oxidizer is or is not activated) from the gas supply (216)."

Regarding claim 2, Somekh discloses "wherein said beam of radicals contains substantially no ionized particles (col. 6, lines 25-29)."

Regarding claim 3, Somekh discloses "wherein said gas supply (216), supplies at least one of oxygen, hydrogen, and fluorine (216)."

Regarding claim 4, Somekh discloses "wherein said downstream radical source provides a beam of at least one of oxygen radicals, hydrogen radicals, and fluorine radicals (col. 6, lines 26-29)."

Regarding claim 5, Somekh discloses "wherein said surface to be cleaned is on one of the patterning structure, a sensor, a lens, a detector, and a reflector for reflecting one of the beam of radiation (203) and the patterned beam (col. 9, line 43 and lines 49-50)."

Regarding claim 6, Somekh discloses "wherein the position of the downstream radical source is fixed (Fig. 2A, where **216** is connected to illumination chamber **204** and chamber **220** via nozzles (**224** and **215**)."

Regarding claim 8, Somekh discloses "wherein the downstream radical source comprises at least one of an RF coil, a pair of DC discharge electrodes, a microwave cavity, and an RF cavity that generates a region of plasma within the flow of gas from the gas supply, the radicals being created in said plasma region (see col. 6, lines 39-43)."

Regarding claim 9, Somekh discloses "wherein the downstream radical source comprises a high temperature element located within the flow of the gas from the gas

supply, the temperature of the high temperature element being sufficient to cause thermal dissociation to create the radicals (col. 6, lines 39-43)."

Regarding claim 10, Somekh discloses "an evacuated chamber (220) that contains the patterning structure (208), the substrate (214), and the projection system (210), wherein the downstream radical source comprises a tube (Figure 2C, 235; col. 7, lines 36-37), the beam of radicals are discharged from an end of said tube (Figure 2C, 235; col. 7, lines 36-37), and said end of the tube (Figure 2C, 235;col. 7, lines 36-37) is located in the evacuated chamber (220)."

Regarding claim 11, Somekh discloses "wherein the region of the downstream radical source (216) in which the radicals are formed is located outside of the evacuated chamber (Figure 2C, **216** is located outside of **230**)."

Regarding claim 12, Somekh discloses "wherein the apparatus comprises at least two downstream radical sources and corresponding beams of radicals for cleaning said surface (col. 10, lines 30-34)."

Regarding claims 13 and 20, Somekh discloses "wherein said surface to be cleaned comprises a surface of an optical element (see col. 3, lines 35-36)."

Regarding claim 15, Somekh discloses the limitations set forth in claims 1 and 14. Somekh also further teaches "wherein said radical source (216) is disposed away from said radiation source (202) such that operating conditions of said radical source (216) do not adversely affect said beam of radiation (203)."

Regarding claim 16, Somekh discloses "a tube connected to the gas supply at one end (see Figure 2A, a tube connecting **216** and**224**), and comprising an orifice

(224) at an opposite end; and a plasma generator (col. 6, lines 38-41) to generate a plasma region, wherein gas from the gas supply (202) flows through the tube (Figure 2A) and through the plasma region such that neutral and ionized particles are created (col. 6, lines 26-29), and the beam of radicals exits the tube at the orifice (224) onto the surface to be cleaned (see col.7, lines 19-22)."

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh in view of Horiike et al (5,308,791).

Somekh teaches "a structure to direct said beam of radicals onto a surface to be cleaned (see col.7, lines 19-22)." Somekh does not teach wherein "said structure comprising a device that moves a component containing said surface such that the beam of radicals is incident on said surface."

However, having "said structure comprising a device that moves the component containing said surface such that the beam of radicals is incident on said surface" is known in the art as is evident to the teaching of Horiike et al (col. 5, lines 6-7 and lines 15-18). It would have been obvious to one ordinary skilled in the art at

the time the invention was made to modify Somekh by including a device to move the component containing the surface to be cleaned in the direction where the beam of radicals is incident on the surface.

The ordinary artisan would have been motivated to modify Somekh in a matter described above for at least the purpose to clean a specified portion of the surface.

5. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh in view of Vane (6,105,589).

Somekh teaches the limitations set forth in claims except (claim 18) "wherein a Faraday grid neutralizes the ionized particles" and (claim 19) "wherein the Faraday grid is disposed at the orifice of the tube."

However, having "wherein a Faraday grid neutralizes the ionized particles" and "wherein the Faraday grid is disposed at the orifice of the tube" is known in the art as is evident to the teaching of Vane (col. 7, lines 62-65). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify Somekh by including a Faraday grid located at the opening of a tube to neutralizes ionized particles.

The ordinary artisan would have been motivated to modify Somekh for at least the purpose to provide a more uniform stream of neutralized ion particles.

6. Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6,427,703) in view of view of Sakai et al (5,312,519).

Somekh teaches the limitations set forth in the claims except "wherein walls of the tube neutralize the ionized particles."

However, having "wherein walls of the tube neutralize the ionized particles" is known in the art as is evident to the teaching of Sakai et al (col. 2, lines 49-51; col. 3, lines 49-51). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify Somekh by including a discharge tube to neutralize the ionize particles.

The ordinary artisan would have been motivated to modify Somekh to utilize a discharge tube to provide a more uniform stream of neutralized ion particles.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing

date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Gutierrez
Examiner
Art Unit 2851

William Perkey
Primary Examiner

December 30, 2005